

WHAT IS CLAIMED IS:

1. A charge amount detection circuit, comprising:
 - a charge sensitive amplifier;
 - a low pass filter circuit provided so as to follow the charge sensitive amplifier; and
 - a voltage amplifier circuit provided so as to follow the low pass filter circuit,wherein one part of circuit elements constituting the low pass filter circuit and one part of circuit elements constituting the voltage amplifier circuit are commonly used.
2. The charge amount detection circuit as set forth in claim 1,
 - wherein a time constant of the low pass filter circuit increases as an amplification of the voltage amplifier circuit increases.
3. The charge amount detection circuit as set forth in claim 1,
 - wherein the low pass filter circuit and the voltage amplifier circuit share a capacitor.
4. The charge amount detection circuit as set forth in claim 3,

wherein the voltage amplifier circuit includes an operational amplifier having an inverted input terminal to which the capacitor is connected, and

the low pass filter circuit includes a resistor and the capacitor that is connected in series with the resistor.

5. The charge amount detection circuit as set forth in claim 1,

wherein the low pass filter circuit and the voltage amplifier circuit share a plurality of capacitors that are connected with each other in parallel, and

a switch for switching between a state in which at least one of the capacitors are inserted in the charge amount detection circuit and a state in which said at least one of the capacitors are not inserted.

6. The charge amount detection circuit as set forth in claim 5,

wherein an amplification of the voltage amplifier circuit is 1 when the state in which said at least one of the capacitors are not inserted is made by the switch.

7. The charge amount detection circuit as set forth in claim 1,

wherein the low pass filter circuit and the voltage amplifier circuit share a plurality of capacitors that are connected with each other in parallel, and

a plurality of switches for respective switching between a state in which at least one of the capacitors are inserted in the charge amount detection circuit and a state in which said at least one of the capacitors are not inserted, numbers of the capacitors that are switched by the respective switches being different from each other.

8. The charge amount detection circuit as set forth in claim 1,

wherein the voltage amplifier circuit includes an operational amplifier, having an inverted input terminal and an output terminal, in which a feedback capacitor is provided between the inverted input terminal and the output terminal.

9. The charge amount detection circuit as set forth in claim 8, further comprising a reset switch for discharging charges stored in the feedback capacitor so as to reset the voltage amplifier circuit.

10. The charge amount detection circuit as set forth in claim 1, further comprising:

a sampling hold circuit for holding a signal amount outputted from the voltage amplifier circuit;

analog to digital converters for analog to digital converting the signal charge that has held by the sampling hold circuit;

a multiplexer for assigning a plurality of input terminals to one of the analog to digital converters; and

a data latch circuit for holding the signal charge that has been converted into a digital value.

11. A two-dimensional image sensor having a charge amount detection circuit, said circuit comprising:

a charge sensitive amplifier;

a low pass filter circuit provided so as to follow the charge sensitive amplifier; and

a voltage amplifier circuit provided so as to follow the low pass filter circuit,

wherein one part of circuit elements constituting the low pass filter circuit and one part of circuit elements constituting the voltage amplifier circuit are commonly used.

12. The two-dimensional image sensor as set forth in claim 11, further comprising a photoelectric conversion section that converts photons into charges and stores the

charges,

wherein the charge amount detection circuit reads the charges from the photoelectric conversion section.

13. The two-dimensional image sensor as set forth in claim 12,

wherein the photoelectric conversion section includes pixel electrodes for holding the charges to which the photons have been converted.

14. The two-dimensional image sensor as set forth in claim 13, further comprising:

data lines that send the charges held by the pixel electrodes to the charge amount detection circuit; and

switching devices that connect the pixel electrodes with the data lines, respectively,

wherein the pixel electrodes flow the charges that have been held to the data lines when the switching devices turn on.

15. The two-dimensional image sensor as set forth in claim 14, further comprising scanning lines that supply voltages for controlling the respective switching elements.